Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

Graphene Oxide for Effective Radionuclide Removal--ESI

Anna Yu. Romanchuk,[a] *Alexander S. Slesarev,*[b] *Stepan N. Kalmykov,*[a,]* *Dmitry V. Kosynkin*[b,‡] *and James M. Tour*[b,c]*

[a] Department of Chemistry, Lomonosov Moscow State University, Leninskie Gory, Moscow 119991, Russia;

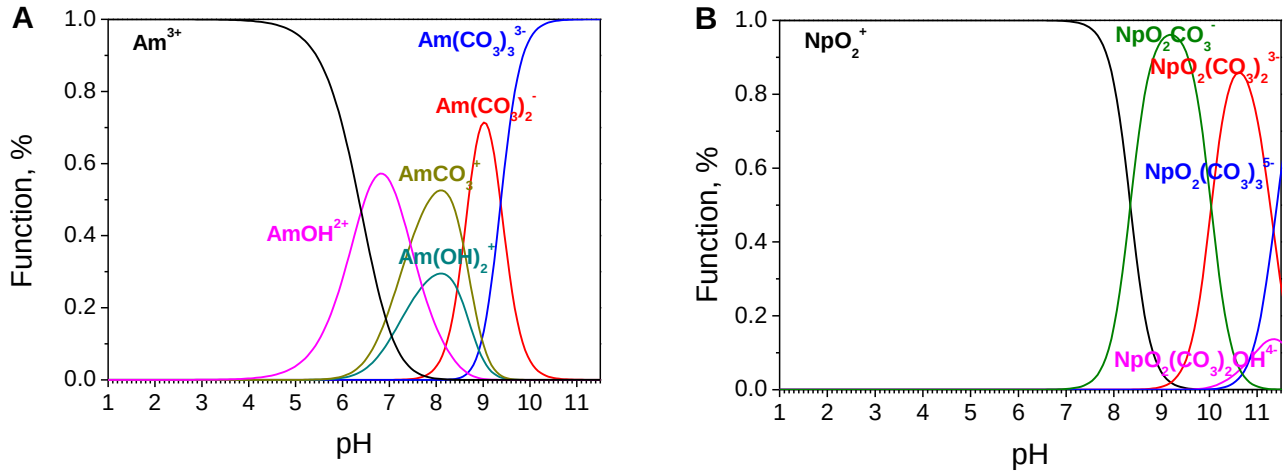
[b] Department of Chemistry, [c] Department of Mechanical Engineering and Materials Science, Rice University, 6100 Main St, Houston, Texas, 77005, USA

*E-mail: stepan@radio.chem.msu.ru, tour@rice.edu

[‡]Now at: Saudi Arabian Oil Company, Dhahran 31311, Saudi Arabia

Table of Contents

Radionuclide speciation, page S1



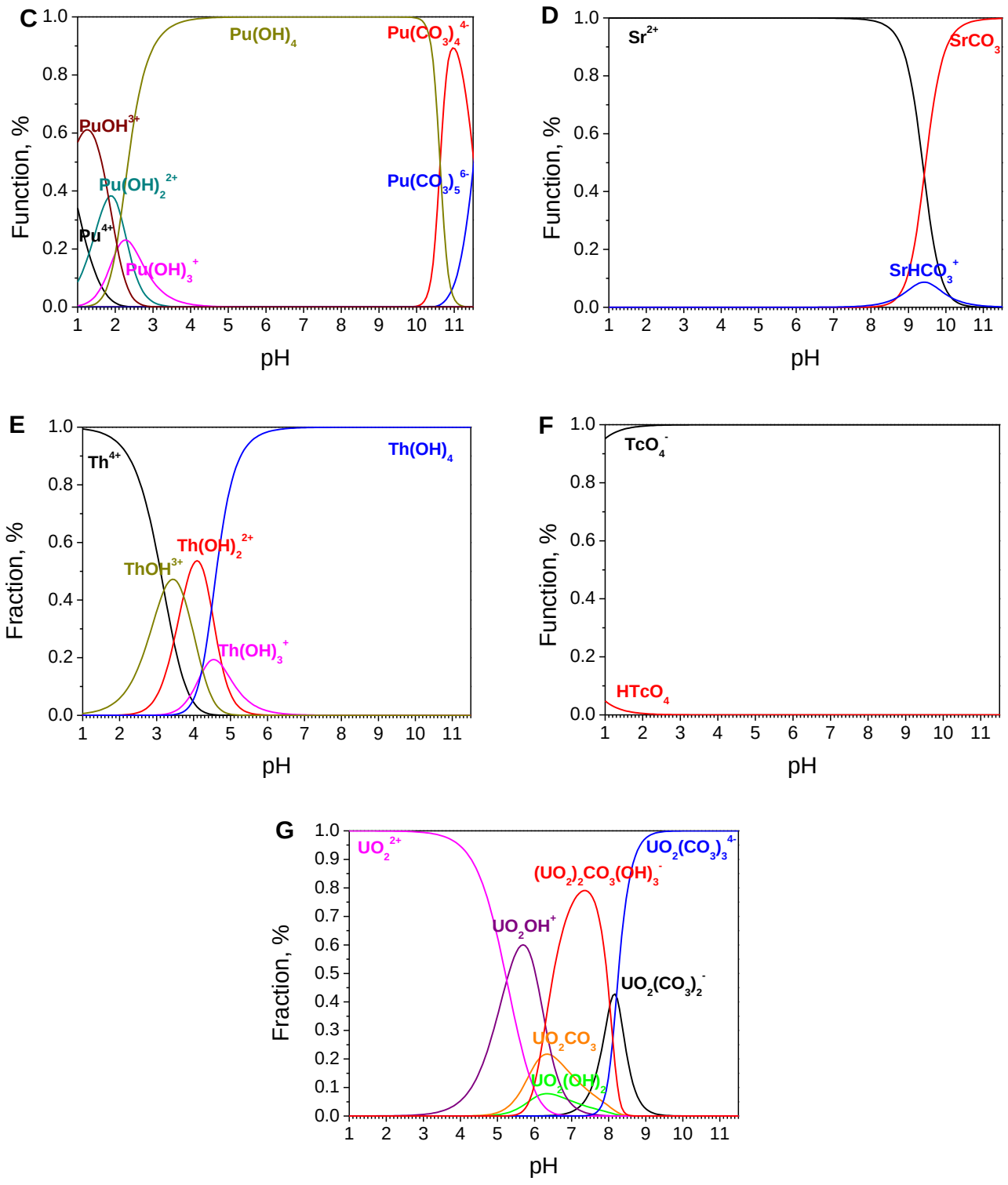


Figure S1. Diagrams of the speciation of the studied radionuclides in solution without modeling sorption reaction. (A) Am, (B) Np, (C) Pu, (D) Sr, (D) Th, (F) Tc, (G) U, and (H) Eu. Compositions of modeled solutions correspond to experimental conditions used in this work, viz. exactly the same concentrations of radionuclides, I = 0.01 M and $p(CO_2) = 10^{-3.5}$ atm. Modeling were done using

HYDRA[1] and MEDUSA[2] software and NEA thermodynamic data.[3-7]

References

1. Hydrochemical Equilibrium-Constant Database, *Ignasi Puigdomenech Inorganic Chemistry*, Royal Institute of Technology, Stockholm, Sweden, Vers. 2004.

2. Make Equilibrium Diagram Using Sophisticated Algorithms. *Ignasi Puigdomenech Inorganic Chemistry*. Royal Institute of Technology, Stockholm, Sweden, Vers. 2004.

3. I. Grenthe, J. Fuger, R. Konings, R. Lemirea, A. Muller, N. Nguyen-Trung Cregu and H. Wanner, *Chemical Thermodynamics of Uranium*. Nuclear Energy Agency, Organization For Economic Co-Operation And Development, 2004.

4. R.Lemire, J. Fuger, H. Nitsche, P. Potter, M. Rand, J. Rydberg, K. Spahiu, J. Sullivan, W. Ullman, P. Vitorge and H. Wanner, *Chemical Thermodynamics of Neptunium and Plutonium*. Nuclear Energy Agency, Organization For Economic Co-Operation And Development, Elsevier, 2001.

5. R. J.Silva, G. Bidoglio, M. H. Rand, P. B. Robouch, H. Wanner and I. Puigdomenech, *Chemical Thermodynamics of Americium*. Nuclear Energy Agency, Organization For Economic Co-Operation And Development, Elsevier, 2004.

6. J. A.Rard, M. H. Rand, A. Anderegg and H. Wanner, *Chemical Thermodynamics of Technetium*. Nuclear Energy Agency, Organization For Economic Co-Operation And Development, Elsevier, 1999.

7. M. H. Rand, J. Fuger, I. Grenthe, V. Nack and D. Rai, *Chemical Thermodynamics of Thorium*. Nuclear Energy Agency, Organization For Economic Co-Operation And Development, Elsevier. 2007.